

Remarks/Arguments:

Claims 1-15 are pending. Claims 9-15 are withdrawn. Claim 1 is currently amended. The amendment is supported, for example, at page 4, lines 16 and 17 of the specification. No new matter has been added.

Rejections under 35 U.S.C. §103

Claims 1-8 stand rejected as unpatentable over U.S. Patent No. 6,534,436 ("Lok et al.") in view of U.S. Patent No. 6,130,184 ("Geerlings et al."). Applicant traverses this rejection and submit that the currently pending claims are patentable over these cited references for at least the reasons set forth below.

"To establish a *prima facie* case of obviousness, ... the prior art reference (or references when combined) must teach or suggest all the claim limitations." M.P.E.P. §2143. Additionally, as set forth by the Supreme Court in KSR Int'l Co. v. Teleflex, Inc., 82 U.S.P.Q.2d 1385 (2007), it is necessary to identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the prior art elements in the manner claimed.

Claim 1, as currently amended, recites:

A process for manufacturing a catalyst which comprises a cobalt species on a titania support, comprising mixing together said titania support and an aqueous solution of cobalt ammine carbonate at a pH in the range 7.5 to 12, and heating to a temperature in the range 60 to 110°C to effect decomposition of the cobalt ammine carbonate and precipitation of an insoluble cobalt compound onto said titania support.

Applicant would like to note that Lok et al. only qualifies as a reference under 35 U.S.C. § 102(e), which cannot be used in an obviousness rejection if the reference was owned by the Applicant at the time of the invention of the present application. Lok et al. was the subject of an assignment by Imperial Chemical Industries PLC to Johnson Matthey PLC and was owned by the Applicant at the time of the invention of the present application. The Applicant recognizes, however, that Lok et al. corresponds to WO 01/62381 (hereinafter the '381 Publication), and for

purposes of responding to the Examiner's objections, the content of the '381 Publication is considered. The '381 Publication was submitted in the Information Disclosure Statement dated March 18, 2005.

Applicant respectfully submits that a *prima facie* case of obviousness has not been shown. The Examiner has not demonstrated that by substituting in silica, the results of the substitution would have been predictable. In fact, there is no reasonable expectation of success in combining the references, and no reason for combining the elements has been provided.

First, there is no teaching in the '381 Publication to use a titania support and a skilled person would not use titania with any reasonable expectation of success. The '381 Publication discloses the preparation of cobalt-on-silica catalysts using certain silicas and solutions of cobalt ammine carbonate at a pH in the range 7.5 to 12, which are decomposed on heating to form catalyst precursors that may be calcined and reduced to provide catalysts in the active form. There is no suggestion whatsoever in the '381 Publication that the claimed method could be employed to make cobalt catalysts supported on titania. It will readily be understood by a person skilled in the art that the physiochemical properties of titania are very different from those of silica. For example, a person skilled in the art would understand titania and silica have different Zeta potentials or electrochemical attractiveness. Thus, the skilled person would not automatically believe that the process described in the '381 Publication could be adapted and used on titania supports with any expectation of success.

There would be no reasonable expectation of success in combining the references in the manner claimed. Geerlings et al. in contrast to the "solution method" of the '381 Publication discloses a method for preparing cobalt catalysts that relies upon the insolubility of a cobalt compound, preferably $\text{Co}(\text{OH})_2$ or Co_3O_4 (Geerlings et al., column 2, line 48), in a liquid, preferably water (Geerlings et al., column 2, line 39), used to treat the titania support. The mixture thus obtained is dried, shaped, and calcined. The cobalt compound, insoluble in the water, may be obtained by precipitation. The preferred precipitation is by addition of a base to a solution of a soluble acidic Co compound or an acid to a cobalt ammonia complex (Geerlings et al., column 3, lines 10-36). For example in a preferred embodiment, cobalt hydroxide and

manganese hydroxide are co-precipitated by addition of ammonia to a slurry comprising acidic cobalt nitrate, manganese nitrate, and titania particles (Geerlings et al., column 3, lines 40-44).

The teachings of Geerlings et al. reinforces the unexpected results of the claimed invention. The "pre-precipitation" method of Geerlings et al. is completely different than the process of the claimed invention, which uses heating under alkaline conditions to decompose the soluble Co complex, evolving ammonia and carbon dioxide, to form Co compounds on the titania supports. Unlike the procedure disclosed in Geerlings et al., the method of the '381 Publication potentially results in the formation of undesired unsupported Co compounds. These undesired unsupported Co compounds may be enhanced with low surface area supports such as titania. Applicant submits that it is surprising that the 'soluble complex' method of the claimed invention provides titania-supported catalysts with high cobalt contents, without forming unsupported cobalt compounds. In fact, it is because of this risk of unsupported cobalt compounds that Geerlings et al. seeks to "pre-precipitate" the cobalt compounds and mix them with the titania to form the catalyst precursors. Accordingly, Applicant submits that the disclosure of Geerlings et al., rather than render the claimed invention obvious, reinforces the finding that the effectiveness of the claimed invention over the '381 Publication is surprising.

Secondly, the Office Action has not identified a reason that would have prompted a person of ordinary skill in the relevant field to combine the prior art elements in the manner claimed.

Thus, as there would be no reasonable expectation of success in combining the references and no reason for combining the elements has been provided, a *prima facie* case of obviousness has not been shown. It is respectfully submitted that independent claim 1 is in condition for allowance. Claims 2-8 depend from claim 1 and therefore should each be allowed for at least the reasons set forth above.

Conclusion

For all of the foregoing reasons, Applicant respectfully requests reconsideration and allowance of the claims. Applicant invites the Examiner to contact their undersigned representative if it appears that this may expedite examination.

Respectfully submitted,



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